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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/818,001	03/27/2001	Nicholas A. Kotov	67183 /01-188	2021

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EXAMINER

LEE, EDMUND H

ART UNIT PAPER NUMBER

1732

DATE MAILED: 01/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/818,001

Applicant(s)

KOTOV, NICHOLAS A.

Examiner

EDMUND H. LEE

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-7 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al (USPN 6391220) in view of the admitted prior art set forth on pg 2, ln 1-pg 3, ln 7. In regard to claim 1, Zhang et al teach the basic claimed process including a method for the assembly of a layer-by-layer thin film (col 4,ln 57-col 5, ln 6; figs 1-5); applying a release layer/substrate to a support surface/substrate (col 2, lns 40-45; col 4,ln 57-col 5, ln 6; figs 1-5)--as a note, it should be mentioned that the release layer and substrate of Zhang et al constitute the claimed substrate and support surface, respectively; forming a layer-by-layer thin film upon the release layer by any suitable process such as electroplating (col 4,ln 57-col 5, ln 6; figs 1-5); removing the release layer together with the thin film from the substrate (col 4,ln 57-col 5, ln 6; figs 1-5); and separating the release layer from the thin film (col 4,ln 57-col 5, ln 6; figs 1-5).

However, Zhang et al does not teach the claimed substeps for forming the thin film.

The admitted prior art teaches it is well-known in the thin film technology to form thin films by the layer-by-layer (LBL) assembly method. The admitted prior art teaches that LBL comprising depositing a film on a substrate by repeating the process of: 1) immersion of the substrate in an aqueous solution of polyelectrolyte; 2) washing with

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neat solvent; 3) immersion in an aqueous solution of nanoparticles; and 4) final washing with neat solvent. This process can be repeated as many times as necessary depending on the number of layers required. Further, the admitted prior art teaches that LBL is an attractive alternative to other thin film deposition techniques because it is simple and universal. Zhang et al and the admitted prior art are combinable because they are analogous with respect to forming a thin film assembly. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the LBL method of the admitted prior art as the deposition process of Zhang et al in order to reduce process complexity. In regard to claim 2, the above combination of Zhang et al and the admitted prior art teach the limitations of claim 2. In regard to claim 3, such is mere obvious matter of choice dependent on the desired final product and of little patentable consequence to the claimed process since it is not a manipulative feature or step of the claimed process. Further, it is well-known in the thin film art to build up layers of different material. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a third substance having an affinity similar to the first substance in the process of Zhang et al (modified) in order to produce diverse thin films. In regard to claim 4, such is mere obvious matter of choice dependent on the desired final product and of little patentable consequence to the claimed process since it is not a manipulative feature or step of the claimed process. Further, it is well-known in the thin film art to use a biological compound as a component of a layer. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a biological compound as one of the

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substances used in the process of Zhang et al (modified) in order to produce diverse thin films. In regard to claim 5, such is mere obvious matter of choice dependent on the desired final product and of little patentable consequence to the claimed process since it is not a manipulative feature or step of the claimed process. Further, it is well-known in the thin film art to build up layers of different material. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a third substance having an affinity similar to the second substance in the process of Zhang et al (modified) in order to produce diverse thin films. In regard to claim 6, such is mere obvious matter of choice dependent on the desired final product and of little patentable consequence to the claimed process since it is not a manipulative feature or step of the claimed process. Further, it is well-known in the thin film art to use a biological compound as a component of a layer. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a biological compound as one of the substances used in the process of Zhang et al (modified) in order to produce diverse thin films. In regard to claim 7, Zhang et al teaches building up layers of the thin film (col 4, ln 57-col 5, ln 6; figs 1-5)--as a note, each layer constitutes a layer of material that structurally stabilizes the thin film. In regard to claims 9-11, such are taught by Zhang et al as evidence at col 5, lns 46-55.

3. Applicant's arguments filed 11/3/03 have been fully considered but they are not persuasive. Applicant argues that Zhang et al teaches away from the claimed invention because the claimed invention forms thin films on the order of a few hundred nanometers whereas Zhang et al forms thin films having a thickness of about 25

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microns or less. This argument is misplaced because the instant claimed invention does not claim a thin film having a thickness on the order of a few hundred nanometers. Further, the instant specification does not define LBL as only forming films having a thickness of a few hundred nanometers. The instant specification discloses that the film *may* be on the order of a few hundred nanometers. Applicant also argues that the substrate of the instant claimed invention cannot be peeled off as taught by Zhang et al because the thin film is too thin to be peeled off. This argument is misplaced like the above argument because the instant claimed invention does not claim a thin film having a thickness on the order of a few hundred nanometers.

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


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5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to EDMUND H. LEE whose telephone number is 571.272.1204. The examiner can normally be reached on MONDAY-THURSDAY FROM 9AM-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Colaianni can be reached on 571.272.1196. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

EDMUND H. LEE
Primary Examiner
Art Unit 1732


1/26/04

EHL